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Claims

1 (Original). A line-set comprising:

a length of tube; and

a micro-electromechanical system (MEMS) element connected to the tube.

2 (Original). The line-set of claim 1 further comprising a controller operably connected to the MEMS element.

3 (Original). The line-set of claim 1 wherein the MEMS element is a flow sensor.

4 (Original). The line-set of claim 1 wherein the MEMS element is a flow valve.

5 (Original). The line-set of claim 1 wherein the MEMS element is a pressure sensor.

6 (Original). The line-set of claim 2 wherein the controller is detachable from the MEMS element.

7 (Original). The line-set of claim 2 wherein the controller has a means for storing information.

8 (Original). The line-set of claim 2 wherein the controller has a means for displaying information.

9 (Original). The line-set of claim 2 wherein the controller has a means for network communication.

10 (Original). The line-set of claim 9 wherein the network communication further comprises means for automated control and interrogation of the MEMS element.

11 (Original). A disposable line-set comprising:

a disposable length of tube; and

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a disposable MEMS element connected to the tube.

12 (**Original**). The line-set of claim 11 further comprising a reusable controller operably connected to the MEMS element.

13 (**Original**). The line-set of claim 11 further comprising a power source operably connected to the MEMS element.

14 (**Original**). The line-set of claim 13 wherein the power source is disposable.

15 (**Original**). A medical line-set comprising:

a length of tube; and

a MEMS pump element attached to the tube.

16 (**Original**). A medical line-set comprising:

a length of tube having a first end adapted to be connected to a container and a second end adapted to be connected to another component, the tube having a MEMS element attached thereon.

17 (**Original**). The line-set of claim 16 further comprising a power source operably connected to the MEMS element.

18 (**Original**). The line-set of claim 16 further comprising a MEMS element controller operably connected to the MEMS element.

19 (**Original**). An infusion system comprising:

a length of tube having a first end adapted to be connected to a container and a second end adapted to be connected to a body, the tube having a MEMS element attached thereon.

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20 (**Original**). The infusion system of claim 19 wherein the MEMS element is a flow sensor.

21 (**Original**). The infusion system of claim 19 wherein the MEMS element is a flow valve.

22 (**Original**). The infusion system of claim 19 wherein the MEMS element is a pressure sensor.

23 (**Original**). The infusion system of claim 19 wherein the MEMS element is a pump.

24 (**Withdrawn**). An infusion system comprising:

a length of tube having a first end adapted to be connected to a container and a second end adapted to be connected to a body, the tube having a MEMS element attached thereon, the MEMS element being controllable by a wireless controller.

25 (**Withdrawn**). The infusion system of claim 24 further comprising a power source operably connected to the MEMS element.

26 (**Withdrawn**). The infusion system of claim 24 wherein the controller has a means for network communication.

27 (**Withdrawn**). The infusion system of claim 24 wherein the tube and MEMS element are disposable.

28 (**Withdrawn**). The infusion system of claim 25 wherein the power source is disposable.

29 (**Withdrawn**). The infusion system of claim 24 wherein the MEMS element is remotely controllable by the wireless controller.

30 (**Original**). A medical line-set comprising:

a length of tube;

a MEMS pump element attached to the tube; and

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a power source connected to the MEMS element.

31 (**Original**). The line-set of claim 30 wherein the power source is detachable from the MEMS element.

32 (**Withdrawn**). A medical line-set comprising:

a length of tube; and

a MEMS element adapted to be attached to the tube, the line-set capable of being implanted inside a body.

a1 33 (**Withdrawn**). The medical line-set of claim 32 further comprising an implantable power source operably connected to the MEMS element.

34 (**Withdrawn**). The line-set of claim 32 further comprising a reusable, wireless MEMS element controller operably connected to the MEMS element.

35 (**Withdrawn**). A disposable medical infusion and draw line-set comprising:

a disposable tube;

a disposable electromechanical pump element connected to the tube;

a reusable pump controller operably connectable to the pump element; and

a disposable reservoir operably attached to the tube.

36 (**Withdrawn**). The system of claim 35 wherein the disposable reservoir has at least one valve.

37 (**Withdrawn**). The system of claim 36 wherein the valve is controlled remotely.

38 (**Withdrawn**). The system of claim 35 wherein the pump element is volumetric.

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39 (**Withdrawn**). The system of claim 35 wherein the pump element is ambulatory.


40 (**Withdrawn**). The system of claim 35 wherein the pump element is wearable.

41 (**Withdrawn**). The system of claim 35 wherein the pump element is portable.

42 (**Withdrawn**). The system of claim 35 wherein the pump element includes a slide clamp.

43 (**Withdrawn**). A medical line-set comprising:

a tube having a first end adapted to be connected to a container and a second end adapted to be connected to another component;

 a MEMS pump attached to the tube and configured to pump fluid from the container through the tube; and

a power source attached to the tubing and operably connected to the MEMS pump.

44 (**Withdrawn**). The medical line-set of claim 43 wherein the MEMS pump and the power source are contained within the tube.

45 (**Original**). A method for delivering a medication from a container to a patient, the method comprising the steps of:

providing tubing having a MEMS pump attached thereto, the MEMS pump being operably connected to a power supply, the tubing having a first end adapted to be in communication with the container and a second end adapted to be in communication with the patient; and

activating the power supply to power the pump wherein the medication is pumped by the MEMS pump from the container to the patient.

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46 (**Withdrawn**). The method of claim 45 further comprising the step of controlling the MEMS pump with an external controller.

47 (**Original**). The method of claim 45 further comprising the step of discarding the tubing and MEMS pump after use.

48 (**Original**). A method of delivering fluid from a container comprising the steps of:

providing tubing having a MEMS pump attached thereto, the tubing having a first end adapted to be in communication with the container and a second end;

providing a controller having a power supply;

operably connecting the controller to the MEMS pump;

activating the controller to provide power to the MEMS pump; and

pumping fluid from the container and through the tubing.

49 (**Original**). The method of claim 48 wherein the controller controls the MEMS pump to deliver fluid at a predetermined rate.

50 (**Currently Amended**). The method of claim 48 wherein the ~~controller is connected to the~~ MEMS pump is operably connected to the controller by a wired connection.

51 (**Withdrawn**). The method of claim 48 wherein the controller is connected to the MEMS pump is operably connected to the controller by a wireless connection.

52 (**Withdrawn**). The method of claim 48 further comprising the step of providing a flow sensor that is attached to the tubing.

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53 (**Withdrawn**). The method of claim 48 further comprising the step of providing a valve that is attached to the tubing.

54 (**Original**). The method of claim 48 further comprising the step of calibrating the MEMS pump with the controller.

55 (**Original**). The method of claim 48 further comprising the step of discarding the tube and MEMS pump after use.

56 (**Withdrawn**). A method of delivering a medication to a patient comprising the steps of:

providing an infusion system having a tubing having a MEMS pump connected thereto, the MEMS pump having a power supply, the tubing having a first end attached to a container containing a medication and a second end;

implanting the infusion system within the patient wherein the second end of the tube is positioned at a desired location;

providing a controller outside of the patient;

activating the controller to activate the MEMS pump; and

pumping fluid from the container and through the second end of the tube wherein the medication is adapted to be delivered to the desired location.

57 (**Original**). A system for infusion comprising:

a length of tube;

a MEMS element connected to the tube; and

means for controlling the MEMS element.

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58 (**Original**). The system of claim 57 further comprising means for storing and displaying infusion data.

59 (**Original**). The system of claim 57 further comprising means for network communication.

60 (**Withdrawn**). The line set of claim 57 wherein the means for controlling the MEMS element is wireless.

61 (**Withdrawn**). The line set of claim 57 further comprising means for operably attaching a disposable power source to the MEMS element.

62 (**Original**). A medical line-set comprising:

a length of tube having a first and second end;

the tube having an attached MEMS element;

means for connecting the first end of the tube to a container; and

means for controlling fluid flow through the tube with the MEMS element.

63 (**Original**). The medical line-set of claim 62 wherein the MEMS element comprises a means for pumping.

64 (**Original**). The medical line-set of claim 62 further comprising means for sensing pressure.

65 (**Original**). The medical line-set of claim 62 further comprising means for sensing flow.

66 (**Original**). The medical line-set of claim 62 wherein the MEMS element comprises a flow valve.

67 (**Original**). The medical line-set of claim 62 wherein the MEMS element comprises means for supplying power.

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68 (**Withdrawn**). The medical line-set of claim 62 further comprising means for implanting the line-set inside a body.

69 (**Withdrawn**). The medical line-set of claim 62 further comprising means for controlling the MEMS element with a wireless remote controller.

70 (**Withdrawn**). A medical line-set comprising:

a length of tube;

a MEMS element adapted to be attached to the tube, and

means for implanting the line-set inside a body.

71 (**Withdrawn**). A disposable medical infusion and draw line-set comprising:

a disposable tube;

a disposable micro-electromechanical pump element connected to the tube;

means for operably connecting a reusable pump controller to the pump element; and

means for operably attaching a disposable reservoir to the tube.

72 (**Withdrawn**). The system of claim 71 wherein the disposable reservoir has at least one valve.

73 (**Withdrawn**). The system of claim 72 wherein the valve is controlled remotely.

